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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/981,643	10/16/2001	Leo W.M. Lau	CUH-003.00	7018

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EXAMINER

KOPPIKAR, VIVEK D

ART UNIT

PAPER NUMBER

1775

DATE MAILED: 03/14/2003

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Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/981,643

Applicant(s)

LAU ET AL.

Examiner

Vivek D Koppikar

Art Unit

1775

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 16 October 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-41 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-5 and 9-41 is/are rejected.
- 7) ☒ Claim(s) 6-8 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 4.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## DETAILED ACTION

### *Claim Objections*

1. Claim 41 is objected to because of the following informalities: On line 1 of Claim 41 the word "of" is repeated twice. Appropriate correction is required.

### *Claim Rejections - 35 USC § 112*

2. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. Claims 22-25 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. It is not clear what is meant by a "stainless steel-rich oxycarbonitrides layer" in line 2. The specification only refers to a "stainless steel-rich oxycarbonitride layer" in section [0010] of the specification but does not provide a person skilled in the art with a concise description of the layer. For the purpose of examination the examiner will interpret this layer to mean a stainless steel substrate which is coated with an oxycarbonitride layer. Appropriate correction and/or clarification is required.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-15 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 1 appears incomplete in the absence of a substrate. If applicant intends a

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coating composition the claim should be so drafted. The examiner has taken the position that the coating is on a substrate.

*Claim Rejections - 35 USC § 102*

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 1 and 9-16 are rejected under 35 U.S.C. 102(b) as being anticipated by US Patent Number 4,714,660 to Gates.

With regard to Claims 1 and 16, Gates teaches hard coatings which are applied to substrates. One of these hard coatings is ZrAlOCN (Col. 12, Ln. 9-32).

With regard to Claim 9, in one embodiment of Gates there is an outer coating in addition to the first coating layer. The outer coating layer and the inner coating layer are both made of oxycarbonitrides in one embodiment of metals such as zirconium and aluminum (Col. 14, Ln. 6-17).

With regard to Claim 10, the ZrAlOCN hard coating in Gates has two distinct phases, therefore the coating has varying relative concentrations through the thickness of the coating (Col. 12, Ln. 20-25).

With regard to Claim 11, the ZrAlOCN coating overlies a ceramic (carbide) substrate (Col. 12, Ln. 9-10).

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With regard to Claim 12, absent evidence of a difference in the coating, the process of its deposition is not seen to provide a patentable distinction. No difference is seen in the coating.

With regard to Claims 13 and 14, the thickness of the ZrAlOCN coating is 3 microns (Col. 12, Ln. 19-20).

With regard to Claim 16, the coating in Gates is applied to a carbide substrate (Col. 3, Ln. 58-59).

6. Claim 18, 26, 28-32 and 37 are rejected under 35 U.S.C. 102(b) as being anticipated by US Patent Number 4,599,281 to Schintlmeister.

With regard to Claims 18, 26, 28-31, Schintlmeister teaches a coating consisting of a plurality of layers. The layers are made from oxycarbonitrides of several metals including aluminum and zirconium. Therefore, the examiner takes the position that Schintlmeister anticipates a decorative hard coating comprising an aluminum oxycarbonitride layer on a zirconium-rich oxycarbonitrides layer (Col. 11, Ln. 40-53).

With regard to Claim 32, the coating is between .1 to 1 microns thick (Col. 12, Ln. 14-16).

With regard to Claim 37, the coating is deposited on a substrate by deposition (Col. 3, Ln. 54-56).

7. Claim 22 is rejected under 35 U.S.C. 102(b) as being anticipated by Japanese Patent Number 08-003750 (hereafter referred to as JP'750).

JP'750 teaches a Al-Ti CNO layer overlying a stainless steel layer (Translated Abstract).

8. Claim 38 is rejected under 35 U.S.C. 102(b) as being anticipated by US Patent Number 4,714,660 to Gates.

Gates teaches forming a ZrAlOCN coating by providing a substrate and forming a layer of ZrAlOCN on the substrate (Col. 12, Ln. 9-31).

9. Claim 40 is rejected under 35 U.S.C. 102(b) as being anticipated by US Patent Number 4,599,281 to Schintlmeister.

Schintlmeister teaches forming a coating on a substrate consisting of a plurality of layers. In one embodiment the layers are made from oxycarbonitrides of zirconium and aluminum. Therefore, the examiner takes the position that Schintlmeister anticipates forming a metal-rich (zirconium) oxycarbonitride layer over the substrate and then forming an aluminum oxycarbonitride layer over the zirconium oxycarbonitride layer.

With regard to Claim 41, the coating is formed in an environment with nitrogen gas (Col. 6, Ln. 60).

***Claim Rejections - 35 USC § 103***

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

11. Claims 2 and 4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gates as applied to claim 1 above, and further in view of the non-patent reference, Government Paper Specification Standards (February 1999, No. 11, p.65).

Gates does not specify the CIELAB value of the decorative coating. However the CIELAB coordinates for a white coating is L=93, a=1.0 and |b|=2.0 as taught in the Government Paper Specification Standard (p. 65). The examiner takes the position that the coating of Gates

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has the CIELAB coordinates as claimed, since the claimed coating is also white according to the specification (Section [0005])

12. Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over Gates as applied to claim 1 above.

Claim 17 is a use claim and it would have been obvious at the time of the invention to have used the claimed coating in any of the recited venues to provide increased resistance to wear.

12. Claims 19-20, 27, 33, 34 and 36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schintlmeister as applied to claims 18 and 26 above, and further in view of the non-patent reference, Government Paper Specification Standards (February 1999, No. 11, p.65).

Schintlmeister does not specify the CIELAB value of the decorative coating. However the CIELAB coordinates for a white coating is  $L=93$ ,  $a=1.0$  and  $|b|=2.0$  as taught in the Government Paper Specification Standard (p. 65). The examiner takes the position that the coating of Schintlmeister has the CIELAB coordinates as claimed, since the claimed coating is also white according to the specification (Section [0005]).

13. Claims 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP'750 as applied to claim 22 above, and further in view of the non-patent reference, Government Paper Specification Standards (February 1999, No. 11, p.65).

JP '750 does not specify the CIELAB value of the decorative coating. However the CIELAB coordinates for a white coating is  $L=93$ ,  $a=1.0$  and  $|b|=2.0$  as taught in the Government Paper Specification Standard (p. 65). The examiner takes the position that the coating of JP'750



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has the CIELAB coordinates as claimed, since the claimed coating is also white according to the specification (Section [0005]).

14. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Gates as applied to claim 1 above, and further in view of US Patent Number 4,731,302 to Weissmantel.

Gates does not teach a specific Vickers hardness for the coating. However Weissmantel teaches that a hard coating has a Vickers hardness of between 10 and 60 GPa (Col. 4, Ln. 50-51). The examiner therefore takes the position that the coating in Gates has Vickers hardness in this range since it is also a hard coating.

15. Claims 21 and 35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schintlmesiter as applied to claims 18 and 27 above, and further in view of US Patent Number 4,731,302 to Weissmantel.

Schintlmeister does not teach a specific Vickers hardness for the coating. However Weissmantel teaches that a hard coating has a Vickers hardness of between 10 and 60 GPa (Col. 4, Ln. 50-51). The examiner therefore takes the position that the coating in Schintlmeister has Vickers hardness in this range since it is also a hard coating.

16. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over unpatentable over Gates in view of the Government Paper Specification Standards.

Gates does not teach a specific Vickers hardness for the coating. However Weissmantel teaches that a hard coating has a Vickers hardness of between 10 and 60 GPa (Col. 4, Ln. 50-51). The examiner therefore takes the position that the coating in Gates has Vickers hardness in this range since it is also a hard coating.

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17. Claim 24 is rejected under 35 U.S.C. 103(a) as being unpatentable over JP'750 in view of the Government Paper Specification Standards.

JP'750 does not teach a specific Vickers hardness for the coating. However Weissmantel teaches that a hard coating has a Vickers hardness of between 10 and 60 GPa (Col. 4, Ln. 50-51). The examiner therefore takes the position that the coating in JP'750 has Vickers hardness in this range since it is also a hard coating.

18. Claim 25 is rejected under 35 U.S.C. 103(a) as being unpatentable over JP'750 as applied to Claim 22 above, and in further view of US Patent Number 4,599,281 to Schintlmeister.

JP'750 does not teach an additional coating layer on the substrate in addition to the metal oxycarbonitride layer.

Schintlmeister teaches a coating which consists of a plurality of layers in order to increase resistance to wear (Col. 2, Ln. 29-31). At the time of the invention one of ordinary skill in the art would have been motivated to add an additional metal oxycarbonitride layer to the substrate in JP'750 with the expectation of increasing the wear resistance of the coating.

19. Claim 39 is rejected under 35 U.S.C. 103(a) as being unpatentable over Gates as applied to Claim 38 above and in further view of US Patent Number 5,624,725 to Nelson.

Gates does not teach the claimed form of arc sputtering.

Nelson teaches arc sputtering using argon, nitrogen and acetylene in order to increase the wear-resistance of a protective coating (Col. 4, Ln. 22-26 and Col. 6, Ln. 31-40). At the time of the invention one of ordinary skill in the art would have been motivated to form the coating in Gates by arc sputtering with the expectation of obtaining a coating with enhanced wear resistant properties as claimed in Nelson.

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*Allowable Subject Matter*

20. Claims 6-8 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

21. The following is a statement of reasons for the indication of allowable subject matter:

The prior art of record does not teach or suggest oxycarbonitride composition in which the concentration of aluminum is less than that of zirconium or specifically where the concentration of aluminum is less than one fifth of that zirconium.

Gates does not teach or suggest an oxycarbonitride composition in which the aluminum composition is less than that of zirconium (Col.12, Ln. 9-32).


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*Conclusion*

22. Any inquiry concerning this communication or earlier communications from the examiner should be directed to **Vivek Koppikar** whose telephone number is **(703) 305-6618**. The examiner can normally be reached on Monday-Friday from 8 AM to 5 PM, Eastern Time.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Deborah Jones, can be reached at (703) 308-3822. The fax phone numbers for the organization where this application or proceeding are assigned are (703) 305-7718 for regular communications and (703) 305-3599 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

  
Vivek Koppikar

3/10/03

  
DEBORAH JONES  
SUPERVISORY PATENT EXAMINER